Innovative Projects
Summer 2014

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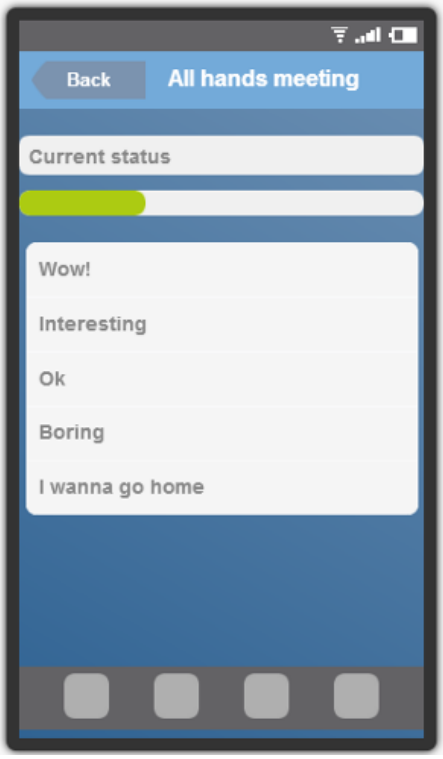
#1	~~Focus meter~~ *(under implementation)*
Project goals	Mobile application for measuring meeting participants focus and engagement.
Scope definition	Mobile application and web server that would allow to monitor participants mood. Based on the survey meeting agenda could be changed. 
Requirements	Windows Phone/Android
Author	Mateusz Jaworski
Planned duration	1 semester
Team size	1-4

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#2	Anonymous surveys
Project goals	Web application for making anonymous surveys
Scope definition	Application should allow survey creation for dedicated group of people. Neither survey author nor participants could be able match people with answers. Participants should be able to verify if their answers were not modified. Security of the solution should be provable. Questions can have a form of T/F checkboxes, comboboxes and text fields (in this case we can assume that the participants are aware of the risk of revealing themselves).
Requirements	-
Author	Mateusz Jaworski
Planned duration	1 semester
Team size	1-4

#3	DocsDB
Project goals	Database system that will be able to store and index any popular form of documents like mails, microsoft office formats, pdfs.
Scope definition	Web application with simple human interface based on google's search engine and RESTful API for feeding the database. Application should provide full-text search for the stored documents which can be based on Elasticsearch database. Possible extensions: - ability to fetch and index e-mail boxes - ability to index files from disks Useful links - http://www.elasticsearch.org - http://tika.apache.org - http://aperture.sourceforge.net
Requirements	NoSQL database
Author	Mateusz Jaworski
Planned duration	1 semester
Team size	1-4

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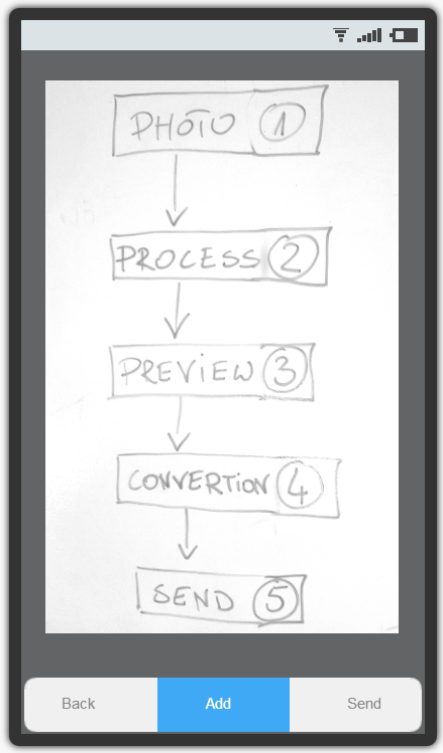
#4	OCR for graphs and structured data
Project goals	Optical character recognition library for conversion of handwritten graphs and structured data into digital format. Implementation can have a form of mobile app.
Scope definition	Graphs can have some fixed form and limited number of elements to recognise, i.e. they can consist of arrows and boxes filled with text. They can be converted to any text format. For structured data you can define some abstract structure like: 'text and number in circle on the right hand side' and application should try to match those with the photo. Example: 
Requirements	-
Author	Mateusz Jaworski
Planned duration	1 semester
Team size	1-3

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#5	~~Augmented notification system~~ *(under implementation)*
Project goals	Composite solution for distributing notifications via light, sound and touch.
Scope definition	The system could have a form of central controller with many different peripheral devices that would be used for handling notifications and alarms. The main aim is to present status of continuous integration server in a highly visible manner. Those peripheral devices could have a form of RGB lamps, signal lights (same as used for the traffic control) or usb rocket launchers.
Requirements	-
Author	Mateusz Jaworski
Planned duration	1 semester
Team size	1-4

#6	~~Mobile application facilitating meeting data exchange~~ *(under implementation)*
Project goals	Application for Android or Windows Phone which facilitates sharing photos, videos and other files between meeting participants.
Scope definition	Project can be implemented in many various ways. Host of the meeting can provide an OCR code, bluetooth or wifi connection to other participants. Once the devices are connected into virtual network and some participant takes a photo or record a video the file is automatically transfered to other devices. Host can create a report from the meeting containing the files, list of participants, date and time, etc. Possible extensions: hosting meeting on PC, sharing mobile screen between other devices.
Requirements	Windows Phone/Android
Author	Mateusz Jaworski
Planned duration	1 semester
Team size	1-4

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#7	~~Meetings Helper Device~~ *(under implementation)*
Project goals	Design and create prototype of device to simplify sending recorded materials (a/v, photos) to meeting attendees.
Scope definition	Meetings Helper should be a standalone device that would allow you to record audio / video and to take photos (with integrated camera or using a phone). At the beginning of the meeting attendees use their ID Cards (with RFID?) to register themselves at the meeting. During the meeting they take some photos / record videos and then using one button the device distributes recorded materials to everyone that has been attending (via e-mail).
Requirements	-
Author	Mateusz Jaworski
Planned duration	1-2 semester
Team size	2-4

#8	Knowledge-based Expert System simulation environment
Project goals	Ready to use simulation environment with CLIPS production system implemented.
Scope definition	Knowledge-Based Expert System (KBES) is an artificial intelligence branch used for defining human-like reasoning, i.e. decision-making. The goal of the project is to integrate CLIPS system with some simulation environment (e.g. MATLAB), propose the object to be controlled, and define some set of production rules to test, whether it works fine enough.
Requirements	C, C++, MATLAB, CMake, general AI knowledge
Author	Pawel Ptasznik
Planned duration	1 semester
Team size	1-2

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#9	Eclipse plugin - Logs parser
Project goals	Implement Eclipse plugin that parses project source code for logs printings. After loading of log file plugin is capable to jump into source code to point the place where log was printed. There are many applications in the world that generate logs in text format. It is difficult to find quickly where given log message comes from.
Scope definition	- Plugin for Eclipse to index code and parse logs - UI Eclipse configuration front-end - Jump into code after selecting particular log line - Ability to filter the log file after applying set of filters
Requirements	- Configurable log format - Configurable log print functions in code (allow support standard and custom print functions) - Jump into code after selecting particular log line - Support for C/C++ or other languages
Author	Grzegorz Kokot
Planned duration	2 semesters
Team size	2-6

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#10	Acceptance tests framework for JS-heavy web applications
Project goals	Web testing framework for acceptance tests in natural language (similar/based on Cucumber) for JS-heavy (AJAX) web applications.

Scope definition	Example:
	
	`OPEN http://www.nsn.com`
	
	`TYPE 'hello' INTO .login-input`
	`TYPE 'pasword' INTO .pass-input`
	`CLICK input[type=submit]`
	
	`ASSERT SUCCESS`
	`ASSERT .status CONTAINS 'welcome'`
	`ASSERT .main-page IS VISIBLE`

Requirements	Java/C#/Python/JS
Author	Dominik Michalski
Planned duration	1 semester
Team size	1-3

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#11	Acceptance tests framework for REST APIs
Project goals	Web API testing/documenting framework in natural language (similar/based on Cucumber or Concordion).

Scope definition	Example:
	
	`OPEN http://www.nsn.com/api/data?id=123`
	
	`ASSERT SUCCESS`
	`ASSERT RESPONSE IS JSON`
	`ASSERT RESPONSE CONTAINS '{`
	`name: <string>,`
	`pages: <array::int>,`
	`data:  id: [1,2,3]`
	`}'`

Requirements	Java/C#/Python/JS
Author	Karol Andrusieczko
Planned duration	1 semester
Team size	1-3

#12	RequireJS support in Eclipse
Project goals	Eclipse plugin that supports basic module operations like organize imports or 'go to definition'
Scope definition	- find usage of an object function - jump to definition (file, function) - organize imports - moving renaming modules
Requirements	Java/JS
Author	Karol Andrusieczko
Planned duration	1 semester
Team size	1-2

#13	Smart, memory-saving collections in Java
Project goals	Java library to store large objects collections in memory. Research and comparison of different techniques.
Scope definition	Create library that transparently saves memory usage of large collections. For instance: serialize objects to disk when they are not accessed.
Requirements	Java
Author	Mateusz Jaworski
Planned duration	1 semester
Team size	1-2

#14	BootstrapTouch 3.0
Project goals	Twitter Bootstrap theme with additional components
Scope definition	Port existing NSN internal web framework based on Twitter Bootstrap 2.3.2 to version 3.0. Write additional components in bootstrap conventions.
Requirements	HTML, CSS3, JS
Author	Karol Andrusieczko
Planned duration	1 semester
Team size	1-2

#15	Jenkins Shepherd
Project goals	Single web application for multiple Jenkins servers managing
Scope definition	Functionalities: mass update, copying single job, copying whole configuration, defining workflows, aggregated statistics, visualisation of jobs relations
Requirements	NodeJS/Python/Java
Author	Mateusz Jaworski, Dominik Michalski
Planned duration	1-2 semester
Team size	1-4

#16	*(under implementation)* **Project goals**
PostgreSQL Shepherd	
Scope definition	Single application for multiple PostgreSQL instances managing
Requirements	Functionalities: copying database or schema between instances, copying roles, executing queries in parallel
Author	NodeJS/Python/Java
Planned duration	Wojciech Stachowski
Team size	1-2 semester

1-4

#17	Jenkins: deployment plugin
Project goals	Plugin for web applications deployment
Scope definition	After build: - connect via ssh with remote server - copy and unzip selected artefacts - run script externally
Requirements	NodeJS/Python/Java
Author	Wojciech Stachowski
Planned duration	1 semester
Team size	1-2

#18	Automated PowerPoint generator
Project goals	Automated ppt presentation generator based on document templates with metatags
Scope definition	Library scans through ppt document, finds metatags i.e. {{document.title}}, {{picture}} and provides an interface for replacing them with text or images.
Requirements	Preferred language: C#
Author	Mateusz Jaworski, Karol Andrusieczko
Planned duration	1-2 semester
Team size	1-4

#19	Jenkins build trigger
Project goals	Jenkins plugin for builds triggering based on result of database query
Scope definition	Jenkins periodically queries the database, builds are triggered when query result matches given condition
Requirements	Support for PostgreSQL, MongoDb
Author	Jacek Tomasiak
Planned duration	1 semester
Team size	1-2

#20	Lightweight & energy saving continuous integration
Project goals	Lightweight server for running build scripts with command line interface for configuration and simple web page for results presentation.
Scope definition	Checkout SVN & Git repositories periodically Run build scripts Parse and visualise result files (Common formats). Notify and display build status (Web page, Emails
Requirements	Preferred technology: NodeJS
Author	Dominik Michalski
Planned duration	1 semester
Team size	1-4

#21	Performance tests plugin for Jenkins
Project goals	Jenkins plugin for execution and visualisation of performance tests' results
Scope definition	- runs JUnit tests marked with @Performance annotation - generates report in xml format - presents results on CI server
Requirements	Preferred language: Java (JUnit)
Author	Dominik Michalski
Planned duration	1 semester
Team size	1-2

#22	Website branding validator
Project goals	Sometimes the branding (i.e. name of company/product, logo or logotype) is changing. It would be useful to have a website crawler to walk the website and validate that all proper changes has been introduced.
Scope definition	A program in any form that will accept inputs as i.e. renames, brand colors etc and will crawl given website looking for errors in logotype or branding.
Requirements	Continuous integration system
Author	Mateusz Wronski
Planned duration	1 semester
Team size	1-2

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#23	LTE System Verification news & team widget
Project goals	Goals of the project comprise design and implementation of system that contains: - News & Team Server - Windows Phone 8 widget - Windows 7, Android, iOS widget System should allow the end user to create any message (text, picture, video) on the server. End-widget (on mobile/PC platform) should allow to read published message (typed on the server) through RSS feed and also to open full HTML article in the browser.
Scope definition	System (i.e. web-based application) should allow creating any message that should be shared to all end-widgets on mobile/PC platform. It should give flexibility to the end-user when creating new message either by: - Providing WYSIWYG editor - HTML panel with standard text format options - Upload panel that allows adding pictures/videos to page content Also adding category to the article would be beneficial. End-user should be able to read only messages from favorite (subscribed) category. End-widgets should allow to read all published messages, refresh the messages, mark them as read, define view (only headers, headers+summary, headers+full article) etc.
Requirements	- Creative design of News & Team Server and end-widgets on different OS platforms. - Programming language or development environment is free to choose, open source-based libraries will be preferable - Possibility of applying database systems - Knowledge of Linux-based operating system - Knowledge of networking protocols - Knowledge of OOP including basics of network programming
Author	Radoslaw Idasiak
Planned duration	1-2 semesters
Team size	3-6

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#24	BTS Test Line Monitor
Project goals	Goals of the project comprise design and implementation of remote monitoring tool providing online preview of test lines status and statistics with options for remote blocking and unblocking cells.
Scope definition	Application or web-based application should monitor and display statuses of test lines taken from specific .xml files defined in BTSs. Moreover it should provide a remote possibility of running predefined scripts in BTSs in order to block or unblock selected cells. Providing statistics of test line statuses with diagrams and charts would be also beneficial.
Requirements	- Creative design of News & Team Server and end-widgets on different OS platforms. - Creative design of monitoring tool - Programming language or development environment is free to choose (e.g. .NET, Java, Phyton, C++, . . .), open source-based libraries will be preferable - Possibility of applying database systems - Knowledge of Linux-based operating system - Knowledge of networking issues (ssh, telnet, TCP/IP) - Knowledge of OOP including basics of network programming
Author	Radoslaw Idasiak
Planned duration	1-2 semesters
Team size	1-2

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#25	Wireless WCDMA Base Station Monitor
Project goals	NodeB wireless access module with data analysis application for Android (graphs, statistics etc.)
Scope definition	Main purpose for this project is to create wireless base station monitoring HW+SW solution for Field Verification and Technical Support technicians. The user will get the overview of basic NodeB parameters in live mode without the need of connecting wires to the site hardware. The main purpose of this project is to speed up on-field network maintenance and diagnosis.
Requirements	- To be familiar with microcontrollers e.g. ARM cortex-3/cortex-4 platforms. - Knowledge about MAC layer, UDP, WiFi, Android OS - Programming skills: C/C++, Java - HW prototype for 10BaseT/Wireless converter - Embedded application written in C/C++ for driving microcontroller - Data acquisition and presentation application written in Java for Android OS
Author	Lukasz Sobczuk, Marcin Dudek
Planned duration	1-2 semesters
Team size	1-2

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#26	Voice Quality tester for WCDMA AMR connections
Project goals	Standalone device designed to test quality of voice connections in WCDMA networks
Scope definition	Main purpose for this project is to create voice quality testing system which is capable to establish AMR connection to itself, generate defined acoustic signal and display Fourier analysis of the same signal at the other side of connection. System can be based on commercial phones.
Requirements	- To be familiar with microcontrollers and DSP - Basic knowledge about WCDMA networks and AMR voice codec - Programming skills - HW prototype - Embedded application for driving microcontroller and signal processing
Author	Marcin Dudek
Planned duration	1-2 semesters
Team size	1-2